

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (currently amended): A process for applying a chromate-free, corrosion resistant coating to a product formed from a magnesium based material, comprising the steps of:

degreasing the product formed from the magnesium based material in a degreasing solution;

cleaning the product formed from the magnesium based material in a highly alkaline cleaning solution;

deoxidizing the product formed from the magnesium based material in a deoxidizing solution; and

immersing the product formed from the magnesium based material in a solution containing phosphate and fluoride ions where a pH level of the solution is controlled in an approximate range of 5 to 7, the solution being provided with 1.0 g/l to 5.0 g/l of an active corrosion inhibitor selected from the group consisting of sodium tungstate, sodium vanadate, and mixtures thereof and being maintained at a temperature of approximately 120 to 200 degrees Fahrenheit while immersing the product formed from the magnesium based material for a period of approximately 15 minutes to 90 minutes.

Claim 2. (cancelled)

Claim 3. (original): A process according to claim 1, wherein said active corrosion inhibitor comprises from 1.0 g/l to 5.0 g/l sodium vanadate.

Claim 4. (original): A process according to claim 1, wherein said active corrosion inhibitor comprises from 2.0 g/l to 5.0 g/l sodium vanadate.

Claim 5. (original): A process according to claim 1, wherein said active corrosion inhibitor comprises from 1.0 g/l to 2.0 g/l sodium tungstate.

Claim 6. (currently amended): A process ~~according to claim 1, wherein said active corrosion inhibitor comprises~~ for applying a chromate-free, corrosion resistant coating to a product formed from a magnesium based material, comprising the steps of:

degreasing the product formed from the magnesium based material in a degreasing solution;

cleaning the product formed from the magnesium based material in a highly alkaline cleaning solution;

deoxidizing the product formed from the magnesium based material in a deoxidizing solution; and

immersing the product formed from the magnesium based material in a solution containing phosphate and fluoride ions where a pH level of the solution is controlled in an approximate range of 5 to 7, the solution being provided with from 1.0 g/l to less than 2.0 g/l potassium permanganate and being maintained at a temperature of approximately 120 to 200 degrees Fahrenheit while immersing the product formed from the magnesium based material for a period of approximately 15 minutes to 90 minutes.

Claim 7. (original): A process according to claim 1, wherein said solution is provided with from about 0.3 to 0.5 wt% sodium bifluoride.

Claim 8. (currently amended): A process ~~according to claim 1, wherein~~ for applying a chromate-free, corrosion resistant coating to a product formed from a magnesium based material, comprising the steps of:

degreasing the product formed from the magnesium based material in a degreasing solution;

cleaning the product formed from the magnesium based material in a highly alkaline cleaning solution;

deoxidizing the product formed from the magnesium based material in a deoxidizing solution; and

immersing the product formed from the magnesium based material in a solution containing phosphate and fluoride ions where a pH level of the solution is controlled in an approximate range of 5 to 7, the solution being provided with 1.0 g/l to 5.0 g/l of an active corrosion inhibitor and being maintained at a temperature of approximately 120 to 200 degrees Fahrenheit while immersing the product formed from the magnesium based material for a period of approximately 15 minutes to 90 minutes; and

said phosphate and fluoride containing solution further ~~contains~~ containing 0.01 to 1.0 vol% of a surfactant.

Claim 9. (original): A process according to claim 1, wherein said magnesium based material comprises a magnesium alloy.

Claim 10. (currently amended): A non-electrolytic process for applying a chromate free, corrosion resistant coating of at least magnesium phosphate and magnesium fluoride to a product formed from a magnesium alloy, comprising the steps of:

degreasing the product formed from the magnesium alloy in a degreasing solution;
cleaning the product formed from the magnesium alloy in a highly alkaline cleaning solution;
deoxidizing the product formed from the magnesium alloy in a deoxidizing solution;
providing a solution containing phosphate and fluoride ions, from about 0.3 to 0.5 wt% sodium bifluoride, and from about 1.0 g/l to 5.0 g/l of an active corrosion inhibitor selected from the group consisting of ~~potassium permanganate~~, sodium tungstate, sodium vanadate, and mixtures thereof, and having a pH level in the range of 5 to 7;
maintaining said solution at a temperature of approximately 120 to 200 degrees Fahrenheit; and
immersing said product formed from said magnesium alloy in said solution for a time period in the range of 15 minutes to 90 minutes.

Claim 11. (currently amended): A process ~~according to claim 10, wherein~~ for applying a chromate free, corrosion resistant coating of at least magnesium phosphate and magnesium fluoride to a product formed from a magnesium alloy, comprising the steps of:

degreasing the product formed from the magnesium alloy in a degreasing solution;
cleaning the product formed from the magnesium alloy in a highly alkaline cleaning solution;

deoxidizing the product formed from the magnesium alloy in a deoxidizing solution;
providing a solution containing phosphate and fluoride ions, from about 0.3 to 0.5 wt% sodium bifluoride, and from about 1.0 g/l to 5.0 g/l of an active corrosion inhibitor selected from the group consisting of potassium permanganate, sodium tungstate, sodium vanadate, and mixtures thereof, and having a pH level in the range of 5 to 7;

maintaining said solution at a temperature of approximately 120 to 200 degrees Fahrenheit;

immersing said product formed from said magnesium alloy in said solution for a time period in the range of 15 minutes to 90 minutes; and

said phosphate and fluoride containing solution further ~~contains~~ containing 0.01 to 1.0 vol% of a surfactant.

Claim 12. (currently amended): A non-electrolytic process for applying a chromate free, corrosion resistant coating of at least magnesium phosphate to a product formed from a magnesium alloy, comprising the steps of:

degreasing the magnesium alloy product in a degreasing solution;
cleaning the magnesium alloy product in a highly alkaline cleaning solution;
deoxidizing the magnesium alloy product in a deoxidizing solution;
providing a coating solution containing phosphate and fluoride ions and being provided with a concentration of sodium bifluoride in a range of 0.3 to 0.5 wt% and a concentration of an active corrosion inhibitor selected from the group consisting of ~~potassium permanganate~~, sodium tungstate, sodium vanadate, and mixtures thereof in a concentration of from 1.0 g/l to 5.0 g/l;
maintaining the coating solution at a temperature of 120 to 200 degrees Fahrenheit; and

immersing the magnesium alloy product in the coating solution for a time period in the range of 15 minutes to 90 minutes.

Claim 13. (currently amended): A process ~~according to claim 12, wherein~~ for applying a chromate free, corrosion resistant coating of at least magnesium phosphate to a product formed from a magnesium alloy, comprising the steps of:

degreasing the magnesium alloy product in a degreasing solution;
cleaning the magnesium alloy product in a highly alkaline cleaning solution;
deoxidizing the magnesium alloy product in a deoxidizing solution;
providing a coating solution containing phosphate and fluoride ions and being provided with a concentration of sodium bifluoride in a range of 0.3 to 0.5 wt% and a concentration of an active corrosion inhibitor selected from the group consisting of potassium permanganate, sodium tungstate, sodium vanadate, and mixtures thereof in a concentration of from 1.0 g/l to 5.0 g/l;
maintaining the coating solution at a temperature of 120 to 200 degrees Fahrenheit;
immersing the magnesium alloy product in the coating solution for a time period in the range of 15 minutes to 90 minutes; and

said phosphate and fluoride containing solution further ~~contains~~ containing 0.01 to 1.0 vol% of a surfactant.

Claim 14. (currently amended): A solution for use in a process for forming a chromate-free, corrosion resistant coating on a product formed from magnesium or a magnesium alloy, comprising:

said solution having phosphate and fluoride ions;

said solution containing from 1.0 g/l to 5.0 g/l of an active corrosion inhibitor selected from the group consisting of ~~potassium permanganate~~, sodium tungstate, sodium vanadate, and mixtures thereof; and

said solution having a pH of 5 to 7.

Claim 15. (original): A solution according to claim 14, wherein said solution further contains about 1.8 ounces per gallon of monobasic potassium phosphate and about 3.6 ounces per gallon of dibasic potassium phosphate.

Claim 16. (original): A solution according to claim 14, further containing from 0.3 to 0.5 wt% sodium bifluoride.

Claim 17. (original): A solution according to claim 14, wherein said active corrosion inhibitor comprises from 2.0 g/l to 5.0 g/l sodium vanadate.

Claim 18. (original): A solution according to claim 14, wherein said active corrosion inhibitor comprises from 1.0 g/l to 2.0 g/l sodium tungstate.

Claim 19. (currently amended): A solution ~~according to claim 14, wherein said active corrosion inhibitor comprises~~ for use in a process for forming a chromate-free corrosion resistant coating on a product formed from magnesium or a magnesium alloy, comprising:

said solution having phosphate and fluoride ions;

said solution containing from 1.0 g/l to less than 2.0 g/l potassium permanganate; and

said solution having a pH of 5 to 7.

Claim 20. (original): A solution according to claim 14, wherein said solution is maintained at a temperature in the range of 120 to 200 degrees Fahrenheit.

Claim 21. (currently amended): A solution ~~according to claim 14, for use in a process for forming a chromate-free, corrosion resistant coating on a product formed from magnesium or a magnesium alloy, comprising:~~

said solution having phosphate and fluoride ions;

said solution containing from 1.0 g/l to 5.0 g/l of an active corrosion inhibitor selected from the group consisting of potassium permanganate, sodium tungstate, sodium vanadate, and mixtures thereof;

said solution having a pH of 5 to 7; and

said solution further comprising from about 0.1 to 1.0 vol% of a surfactant.